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09/782,098	02/13/2001	Lothar B. Moeller	Moeller 9-12	2771

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MOSER, PATTERSON & SHERIDAN L.L.P.
595 SHREWSBURY AVE, STE 100
FIRST FLOOR
SHREWSBURY, NJ 07702

EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

A

Office Action Summary	Application No. 09/782,098	Applicant(s) MOELLER ET AL.
	Examiner Nathan Curs	Art Unit 2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 28-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *32 and 38* is/are allowed.

6)☒ Claim(s) *1-7, 9, 11-31, and 33-37* is/are rejected.

7)☒ Claim(s) *8 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 and 6*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 19 is rejected under 35 U.S.C. 102(e) as being anticipated by Erdogan et al. (US Patent No. 6211957).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 19, Erdogan et al. disclose an apparatus for polarization measurement, comprising: a polarization controller adapted to receive an optical signal and perform defined polarization transformations of the received optical signal, and a polarizer adapted to receive the optical signal exiting the polarization controller and define a polarization axis for the received optical signal (fig. 6, element 62, col. 4, lines 48-50 and col. 10, lines 52-56), where the quarter-wave plate is inherently a polarization controller and where an optical signal passing through a quarter-wave plate in position relative to an adjacent polarizer is inherently a polarization

transformation, and where the polarization axis of an optical signal is inherently defined when passing through a polarizer; a wavelength dispersive element for separating the optical signal exiting the polarizer into a plurality of spectral components, and a photo-detector for detecting the plurality of spectral components (col. 11, lines 19-34).

3. Claims 25 is rejected under 35 U.S.C. 102(e) as being anticipated by Moeller (US Published Patent Application No. 2002/0093643).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 25, Moeller discloses a system for determining polarization mode dispersion in a transmission system, comprising: propagating a data signal characterized by a wavelength range through an optical fiber in the transmission system and determining the polarization mode dispersion in the optical fiber (paragraphs 0006 to 0008) by: directing a portion of the data signal into a polarization analyzer (paragraph 0007 and fig. 1, element 140) and measuring optical powers for the portion of the data signal as a function of wavelength within the wavelength range (paragraphs 0008 and 0009); and generating polarization parameters from the optical powers measured (paragraph 0009). Moeller also discloses directing the data signal through a polarization switch (paragraph 0007 and fig. 1, element 120). Moeller also discloses measurements for two different and non-orthogonal polarization states of the data signal generated by the polarization switch (fig. 1 and paragraph 0009).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-7, 9, 11-21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Hunsperger et al. (US Patent No. 4773063).

Regarding claims 1 and 11, Lee discloses a method of polarization measurement, comprising: (a) directing an optical signal characterized by a polarization state into a polarization controller (col. 1, lines 10-25), where an optical transmission signal inherently has a polarization state and where a quarter-wave plate is inherently a polarization controller; (b) directing the optical signal from the polarization controller into a polarizer (col. 1, lines 22-24); (e) setting the polarization controller to a plurality of positions, and (f) for each of the plurality of positions of the polarization controller, measuring the power of the optical signal using a photo-detector (col. 1, lines 28-31); and (g) obtaining the polarization state of the optical signal by analyzing the powers of the optical signal measured in (f), where it would have been obvious to one of ordinary skill in the art at the time of the invention that the four angular position measurements of Lee would be measured for determining Stokes parameters, corresponding to polarization-dependent fractions of light, and used to determine the polarization state, as similarly described for other prior art of different embodiment (col. 1, lines 51-58), and which four Stokes parameters are well known in the art for determining polarization state. Lee does not disclose directing the optical signal from the polarizer to a wavelength dispersive element to generate a dispersed optical signal comprising a plurality of spectral components each characterized by a

wavelength range, or directing the dispersed optical signal into a photo-detector for detecting the plurality of spectral components. Hunsperger et al. disclose a WDM demultiplexer comprising a wavelength dispersive element demultiplexing a plurality of spectral components, and a photodetector for detecting the spectral components (col. 3, lines 19-33). Although Hunsperger et al. do not disclose details about the upstream source of WDM signal in context of the grating based demultiplexer, it would have been obvious to one of ordinary skill in the art at the time of the invention that a wavelength range characterizes each transmitted WDM channel, since Hunsperger et al. discloses that for a grating multiplexer the light source for each WDM channel is characterized by a wavelength range depending on the light source type (col. 8, line 56 to col. 9, line 4). Hunsperger et al. also teach that WDM enlarges the information transmission capacity of the system, thereby drastically reducing the cost per information channel in both materials of construction and installation (col. 2, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the polarization measurement system of Lee by replacing the photodetector of Lee with the grating demultiplexer plus WDM photodetector of Hunsperger et al., in order to be able to take polarization measurements for the channels of a WDM system without requiring separate instances of single channel Lee polarization measurement systems for each WDM wavelength of a WDM system, thus the Lee polarization measurements system as modified by the teaching of Hunsperger et al. will also reflect the reduced cost per information channel in both materials of construction and installation similarly reflected by the WDM system itself.

Regarding claim 2, Lee in view of Hunsperger et al. disclose the method of claim 1, wherein the photo-detector is a photodiode array comprising a plurality of detectors (Hunsperger et al.: fig. 2, element 18 and col. 2, lines 35-40).

Regarding claim 3, Lee in view of Hunsperger et al. disclose the method of claim 2, wherein at least a subset of the plurality of detectors each detects only a portion of the dispersed optical signal (Hunsperger et al.: col. 3, lines 19-33). Lee in view of Hunsperger et al. do not disclose characteristics of the value of the Stokes vector within each of the detectors in a subset of detectors; however, Lee does disclose four angular positions of the quarter-wave plate in taking measurements (Lee: col. 1, lines 28-31), and Hunsperger et al. disclose that the each detector in the array detects a narrow portion of the dispersed optical signal corresponding to a channel's center wavelength (col. 6, lines 23-56). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that specific quarter-wave plate positions and focused wavelength photodetection would result in each of the four Stokes parameters measured for each wavelength remaining constant within each detector, in order to be able to calculate the state of polarization accurately for each WDM wavelength, avoiding detecting misleading Stokes parameters if the quarter-wave plate were not set to distinct positions for measurement (i.e. rotation change during a measurement) and/or if the photodetectors detected overlapping WDM wavelengths.

Regarding claims 4 and 12, Lee in view of Hunsperger et al. disclose the method of claim 3, wherein (e) comprises setting the polarization controller to at least four different positions (Lee: col. 1, lines 28-31).

Regarding claims 5 and 13, Lee in view of Hunsperger et al. disclose the method of claim 4, wherein (g) further comprises: (g1) generating an optical power parameter for each of the subset of the plurality of detectors (Hunsperger et al.: col. 6, lines 23-56), where the detected power for each wavelength detector is thus an optical power parameter corresponding to the wavelength range of the wavelength detector; where it would have been obvious to one of ordinary skill in the art at the time of the invention that the four angular position measurements

of Lee measured for calculating Stokes parameters would be used obtain the polarization state of the optical signal, as described above, and where it would have been obvious to one of ordinary skill in the art at the time of the invention that the Stokes parameters would be thus calculated for each wavelength range of each WDM detector when applied in the combination of Lee in view of Hunsperger et al., in order to determine the state of polarization for each wavelength of a WDM signal.

Regarding claim 6, Lee in view of Hunsperger et al. disclose the method of claim 5, further comprising: (h) calculating an optical power for the optical signal (Hunsperger et al.: Hunsperger et al.: fig. 2, element 18 and col. 6, lines 23-56).

Regarding claim 7, Lee in view of Hunsperger et al. disclose the method of claim 6, wherein the optical signal is a data signal in a wavelength division multiplexed (WDM) system and one or more of the plurality of spectral components in the dispersed optical signal correspond to a plurality of WDM optical channels (col. 3, lines 19-33).

Regarding claim 9, Lee in view of Hunsperger et al. disclose the method of claim 1, wherein the polarization controller is a quarter-wave plate rotated between plural positions (Lee: col. 1, lines 28-31), but do not disclose that the rotation is a function of time. However, since the single quarter-wave plate is used for four different measurements, it would have been obvious to one of ordinary skill in the art at the time of the invention to increment the quarter-wave plate to each of the four positions at a given rate, in order to provide the advantage of uniform measurements for each of the positions.

Regarding claim 14, Lee in view of Hunsperger et al. disclose the method of claim 11, wherein the plurality of positions in (e) is at least four (Lee: col. 1, lines 28-31), and the at least one desired property in (g) are the polarization state and an optical power of the optical signal (Hunsperger et al.: col. 6, lines 23-56), where the detected power for each wavelength detector

is thus an optical power parameter corresponding to the wavelength range of the wavelength detector; where it would have been obvious to one of ordinary skill in the art at the time of the invention that the four angular position measurements of Lee measured for calculating Stokes parameters would be used obtain the polarization state of the optical signal, as described above, and where it would have been obvious to one of ordinary skill in the art at the time of the invention that the Stokes parameters would be thus calculated for each wavelength range of each WDM detector when applied in the combination of Lee in view of Hunsperger et al., in order to determine the state of polarization for each wavelength of a WDM signal.

Regarding claim 15, Lee disclose a method of monitoring degree of polarization of an optical signal, comprising: (a) directing the optical signal into a polarization controller (col. 1, lines 10-25), where a quarter-wave plate is inherently a polarization controller; (b) directing the optical signal from the polarization controller into a polarizer (col. 1, lines 22-24); (d) directing the optical signal from the polarizer to a photo-diode (col. 1, lines 26-28); (e) setting the polarization controller to a plurality of positions and (f) for each of the plurality of positions of the polarization controller, measuring an optical power detected by the detector (col. 1, lines 28-31); and (g) obtaining the degree of polarization of the optical signal by analyzing the optical powers measured in (f), where it would have been obvious to one of ordinary skill in the art at the time of the invention that the four angular position measurements of Lee would be measured for determining Stokes parameters, corresponding to polarization-dependent fractions of light, and used to determine the polarization state, as similarly described for other prior art of different embodiment (col. 1, lines 51-58), and which four Stokes parameters are well known in the art for determining polarization state. Lee does not disclose directing the optical signal from the polarizer to a wavelength dispersive element to generate a dispersed optical signal comprising a plurality of spectral components, or directing the dispersed optical signal into a photo-diode

array comprising a plurality of detectors for detecting the plurality of spectral components. Hunsperger et al. disclose a WDM demultiplexer comprising a wavelength dispersive element demultiplexing a plurality of spectral components, and a photodetector for detecting the spectral components (col. 3, lines 19-33). Hunsperger et al. also teach that WDM enlarges the information transmission capacity of the system, thereby drastically reducing the cost per information channel in both materials of construction and installation (col. 2, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the polarization measurement system of Lee by replacing the photodetector of Lee with the grating demultiplexer plus WDM photodetector of Hunsperger et al., in order to be able to take polarization measurements for the channels of a WDM system without requiring separate instances of single channel Lee polarization measurement systems for each WDM wavelength of a WDM system, thus the Lee polarization measurements system as modified by the teaching of Hunsperger et al. will also reflect the reduced cost per information channel in both materials of construction and installation similarly reflected by the WDM system itself.

Regarding claim 16, Lee in view of Hunsperger et al. disclose the method of claim 15, wherein the optical signal is a data signal in a wavelength division multiplexed (WDM) system characterized by a plurality of WDM channels (Hunsperger et al.: col. 2, lines 10-51), where an information signal is a data signal.

Regarding claim 17, Lee in view of Hunsperger et al. disclose the method of claim 16, wherein each of the plurality of WDM channels is detected by a different subset of the plurality of detectors (Hunsperger et al.: col. 6, 23-56), where a subset comprises one detector as disclosed by Hunsperger et al.

Regarding claim 18, Lee in view of Hunsperger et al. disclose the method of claim 17, wherein (g) further comprises calculating Stokes components corresponding to each of the

plurality of WDM channels to obtain the degree of polarization for each of the plurality of WDM channels, as described above.

Regarding claim 19, Lee discloses an apparatus for polarization measurement, comprising: a polarization controller adapted to receive an optical signal and perform defined polarization transformations of the received optical signal (col. 1, lines 22-30), where an optical signal passing through a quarter-wave plate in a rotated position relative to an adjacent polarizer is inherently a polarization transformation; a polarizer adapted to receive the optical signal exiting the polarization controller and define a polarization axis for the received optical signal (col. 1, lines 22-30), where the polarization axis of an optical signal is inherently defined when passing through a polarizer; and measuring the power of the optical signal output from the polarizer using a photo-detector (col. 1, lines 28-31). Lee does not disclose a wavelength dispersive element for separating the optical signal exiting the polarizer into a plurality of spectral components and detecting the plurality of spectral components. Hunsperger et al. disclose a WDM demultiplexer comprising a wavelength dispersive element demultiplexing a plurality of spectral components, and a photodetector for detecting the spectral components (col. 3, lines 19-33). Hunsperger et al. also teach that WDM enlarges the information transmission capacity of the system, thereby drastically reducing the cost per information channel in both materials of construction and installation (col. 2, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the polarization measurement system of Lee by replacing the photodetector of Lee with the grating demultiplexer plus WDM photodetector of Hunsperger et al., in order to be able to take polarization measurements for the channels of a WDM system without requiring separate instances of single channel Lee polarization measurement systems for each WDM wavelength of a WDM system, thus the Lee polarization measurements system as modified by the teaching

of Hunsperger et al. will also reflect the reduced cost per information channel in both materials of construction and installation similarly reflected by the WDM system itself.

Regarding claim 20, Lee in view of Hunsperger et al. disclose the apparatus of claim 19, wherein the wavelength dispersive element is a grating (Hunsperger et al.: col. 2, lines 10-34).

Regarding claim 21, Lee in view of Hunsperger et al. disclose the apparatus of claim 19, wherein the photo-detector is a photodiode array (Hunsperger et al.: col. 3, lines 19-33).

Regarding claim 24, Lee in view of Hunsperger et al. disclose the apparatus of claim 19, wherein the wavelength dispersive element has an optical resolution at least sufficient to resolve adjacent signal channels in a wavelength division multiplexed communication system (Hunsperger et al.: col. 2, lines 10-51 and col. 6, lines 23-56).

6. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Hunsperger et al. (US Patent No. 4773063) as applied to claims 1-6, 9, 15-21 and 24 above, and further in view of Heismann (US Patent No. 5212743).

Regarding claims 22 and 23, Lee in view of Hunsperger et al. disclose the apparatus of claim 19, but do not disclose that the polarization controller is a lithium niobate electro-optic device. Heismann discloses an electro-optic lithium niobate polarization controller used for transforming the state of polarization of a signal (col. 4, lines 3-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an electro-optic lithium niobate polarization controller, disclosed by Heismann, in the system of Lee in view of Hunsperger et al., because of the small size that can be achieved, relative to a mechanically rotated quarter-wave plate, when using a lithium niobate device.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Liedenbaum et al. (US Patent No. 5625727).

Regarding claim 25, Lee discloses a method of determining a polarization mode dispersion in a transmission system, comprising: (a2) propagating a data signal characterized by a wavelength range through an optical fiber in the transmission system and (b) determining the polarization mode dispersion in the optical fiber concurrent with (a) by: (b1) directing a portion of the data signal into a polarization analyzer, (b2) measuring optical powers for the portion of the data signal as a function of wavelength within the wavelength range for at least two different and non-orthogonal polarization states of the signal and (b3) generating polarization parameters from the optical powers measured in (b2) (col. 1, lines 10-31 and lines 51-58). Lee does not disclose directing a data signal through a polarization switch, although an optical transmitter is inherent to the system of Lee. Liedenbaum et al. disclose a polarization switch optical transmitter for generating an optical data signal (col. 2, lines 24-50 and col. 8, lines 31-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a polarization switch optical transmitter for upstream data transmission since such a transmitter is relatively simple, inexpensive, and suitable to high transmission rates, as taught by Liedenbaum et al. (col. 2, lines 24-29).

Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Liedenbaum et al. (US Patent No. 5625727) as applied to claim 25 above, and further in view of Hunsperger et al. (US Patent No. 4773063).

Regarding claim 28, Lee in view of Liedenbaum et al. disclose the method of claim 25, wherein the polarization analyzer comprises a polarization controller, a polarizer and a photo-detector (Lee: col. 1, lines 10-31 and lines 51-58). Lee does not disclose a wavelength

dispersive element; however, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the wavelength dispersive element teaching of Hunsperget et al. with Lee as described above for claims 1 and 11.

Regarding claim 29, Lee in view of Liedenbaum et al. and further in view of Hunsperger et al. disclose the method of claim 28, wherein (b1) further comprises (i) directing the portion of the data signal into the polarization controller, (ii) directing the portion of the data signal from the polarization controller into the polarizer (Lee: col. 1, lines 10-31 and lines 51-58), (iii) generating a plurality of spectral components by directing the portion of the data signal from the polarizer onto the wavelength dispersive element, and (iv) directing the plurality of spectral components into the photo-detector; wherein the photo-detector is a photo-detector array (Hunsperger et al.: col. 3, lines 19-33).

Regarding claim 30, Lee in view of Liedenbaum et al. and further in view of Hunsperger et al. disclose the method of claim 29, wherein the transmission system is a wavelength division multiplexing (WDM) system, and the data signal comprises a plurality of wavelengths corresponding to a plurality of optical channels in the WDM transmission system, as described above for claims 1 and 11.

Regarding claim 31, Lee in view of Liedenbaum et al. and further in view of Hunsperger et al. disclose the method of claim 30, further comprising: in (b1), generating sequentially at least four different polarization states for the data signal by adjusting the polarization controller of the polarization analyzer; and in (b2), measuring respective optical powers for each of the plurality of optical channels for each of the at least four different polarization states generated sequentially in (b1) (Lee: col. 1, lines 10-31 and lines 51-58).

7. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Hunsperger et al. (US Patent No. 4773063), and further in view of Liedenbaum et al. (US Patent No. 5625727).

Regarding claim 33, as described above for claims 1 and 11, Lee in view of Hunsperger et al. disclose an apparatus for determination of polarization mode dispersion in an optical fiber, comprising: an optical fiber inherently characterized by a polarization mode dispersion and a polarization analyzer connected to an output of the optical fiber, wherein the polarization analyzer comprises a polarization controller, a polarizer, a wavelength dispersive element and a photo-detector. Lee in view of Hunsperger et al. do not disclose a polarization switch connected to an input of the optical fiber, although an optical transmitter is inherent to the system of Lee and further it would have been obvious to one of ordinary skill in the art at the time of the invention to use a plurality of transmitters in the system of Lee in view of Hunsperger et al. for each WDM channel of Lee in view of Hunsperger et al. as described above for claims 1 and 11. Liedenbaum et al. disclose a polarization switch optical transmitter for generating an optical data signal (col. 2, lines 24-50 and col. 8, lines 31-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a polarization switch optical transmitter for upstream data transmission since such a transmitter is relatively simple, inexpensive, and suitable to high transmission rates, as taught by Liedenbaum et al. (col. 2, lines 24-29).

Regarding claim 34, Lee in view of Hunsperger et al. and further in view of Liedenbaum et al. disclose the apparatus of claim 33, wherein the wavelength dispersive element is a diffraction grating (Hunsperger et al.: col. 3, lines 19-33).

Regarding claim 35, Lee in view of Hunsperger et al. and further in view of Liedenbaum et al. disclose the apparatus of claim 34, wherein the photo-detector is a photodiode array (Hunsperger et al.: col. 3, lines 19-33).

8. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent No. 5815270) in view of Hunsperger et al. (US Patent No. 4773063), and further in view of Liedenbaum et al. (US Patent No. 5625727) as applied to claims 33-35 above, and further in view of Heismann (US Patent No. 5212743).

Regarding claims 36 and 37, Lee in view of Hunsperger et al. and further in view of Liedenbaum et al. disclose the apparatus of claim 35, but do not disclose that the polarization controller is a lithium niobate electro-optic device. Heismann discloses an electro-optic lithium niobate polarization controller used for transforming the state of polarization of a signal (col. 4, lines 3-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an electro-optic lithium niobate polarization controller, disclosed by Heismann, in the system of Lee in view of Hunsperger et al., because of the small size that can be achieved, relative to a mechanically rotated quarter-wave plate, when using a lithium niobate device.

Allowable Subject Matter

9. Claims 32 and 38 are allowed.

10. Claims 8 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims

Response to Amendment

11. The affidavit under 37 CFR 1.132 filed 15 June 2004 is insufficient to overcome the rejection of claims 25-27 based upon Erdogan et al. as applied under 35 U.S.C. 102 as set forth in the last Office action because: the inventive entity of the instant application is different from the application 09/518296 (Moeller), regardless of the declaration by Moeller as being the inventor of application 09/518296. The declaration that any invention disclosed but not claimed in application 09/518296 was derived by Moeller and is thus not the invention "by another" is not accurate, because the inventive entity of 09/518296, Moeller, is different from the inventive entity of the instant application, Moeller and Westbrook.

Response to Arguments

12. Applicant's arguments filed 15 June 2004 have been fully considered but with regard to claims 1-6, 15-21 and 24-25, they are not persuasive.

Regarding claim 19, the applicant argues that Erdogan et al. do not disclose the limitation "a wavelength dispersive element for separating the optical signal exiting the polarizer in to a plurality of spectral components" as arranged in the claim, and that the grating of Erdogan et al. does not indicate a teaching of the wavelength dispersive element of the applicant's claim 19. However, the Examiner disagrees with the applicant's argument and asserts that Erdogan et al. discloses the limitation of claim. Specifically, Erdogan et al. teaches the sequence of polarizer to detector in the signal path (col. 4, lines 48-50) and teaches a wavelength dispersive element and detector array for separating the optical signal exiting the polarizer into a plurality of spectral components, in the case of multiwavelength signals (col. 11, lines 19-34). Primarily, Erdogan et al. discloses that "different wavelengths will diffract out of the fiber at slightly different angles". This is the same as separating the signal into a plurality of spectral components. Secondarily, Erdogan et al. states the multi-wavelength approach is well

known and gives the example of gratings. Further, the specification is not the measure of invention; therefore, limitations contained therein cannot be read into the claims for the purpose of avoiding the prior art.

In addition, regarding claim 19, the applicant argues that Erdogan et al. do not disclose the limitation "a polarization controller adapted to receive an optical signal and perform defined polarization transformations of the received optical signal" as taught and claimed by the applicant's claim 19. However, Erdogan et al. do disclose the limitation as previously cited (fig. 2, element 62, col. 4, lines 48-50 and col. 10, lines 52-56). The applicant argues to differentiate the applicant's claimed invention from Erdogan et al. by arguing that the applicant only needs a single detector array because the polarization controller transforms the polarization of the input signal at various polarization states. However, since the specification cannot be read into the claim for the purpose of avoiding the prior art, the applicant's single detector array and specific polarization controller transforms cannot be read into the claim from the specification to avoid Erdogan et al.

Regarding claims 1-6, 15-21 and 24, the applicant argues against the combination of Lee in view of Hunsperger et al., stating "there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination", "the teachings of the references can be combined only if there is some suggestion or incentive in the prior art to do so", that "hindsight is strictly forbidden", and "the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification". However, it is not necessary that the references actually suggest, expressly or in so many words, the changes or improvements that the applicant has made. The test for combining references is what the references as a whole would have suggested to one of ordinary skill in

the art. Lee discloses the development of fiber optic systems toward longer transmission distances and higher information transfer rates and how this increases the importance of measuring the polarization state of a fiber (col. 1, lines 10-13) and Hunsperger et al. teaches that WDM enlarges the information transmission capacity of the system, thereby drastically reducing the cost per information channel (col. 8, line 56 to col. 9, line 4). These teachings taken together, at least, would have suggested to one of ordinary skill in the art at the time of the invention to combine the WDM-based teaching of Hunsperger et al. with the Lee, in light of the cost effective increase of transmission capacity provide through WDM. In addition, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper.

The applicant also argues that the individual detectors receiving the elements of the dispersed optical signal in Hunsperger et al. do not meet the applicant's limitation where "the dispersed optical signal" is directed "into a photo-detector for detecting the plurality of spectral components". However, the limitation "comprising: ... direction the dispersed optical signal into a photo-detector" is met by Hunsperger et al. because the plurality of detectors of Hunsperger et al. comprise "a photo-detector", such a photo-detector receiving the dispersed optical signal.

Conclusion

13. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600